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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/589,521	08/16/2006	Bernd Teipen	344/1/114	9439

170 7590 08/14/2009

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EXAMINER	
LETTMAN, BRYAN MATTHEW	
ART UNIT	PAPER NUMBER
3746	
MAIL DATE	DELIVERY MODE
08/14/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/589,521	TEIPEN, BERND	
	Examiner	Art Unit	
	Bryan Lettman	3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 May 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,5-11 and 13-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,5-11 and 13-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 August 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

The amendment filed May 28, 2009 has been entered. Claims 1, 5-11 and 13-15 remain pending in the application. Claims 2-4 and 12 have been cancelled.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 5, 6, 9-11 and 13-15 rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent 5,577,890 to Nielsen in view of U. S. Patent 5,362,206 to Westerman.

Referring to claim 1, Nielsen teaches a pump control method comprising the steps of:

at least one measurement step which measures an alternating voltage applied to a pump motor of a synchronous pump (col. 3, lines 64-65) and an alternating current of the motor (col. 3, line 66 - col. 4, line 2) to provide recorded measured values;

a determination step which:

determines an extent of a phase shift between the alternating voltage and the alternating current at different times from the recorded measured values (col. 4, lines 4-7); and

an assignment step which assigns the determined characteristic to a predetermined pump operating state in an assignment step (col. 6, lines 28-32 and lines 54-62).

Neilsen does not teach the step of monitoring the phase shift over time. Westerman teaches a pump control method further comprising the step of:

determining the chronological progression of the phase shift from multiple recorded measured values (integration is used as a means for reducing the data over a certain period of time into a more manageable data point, col. 7, lines 20-22, and the accumulation of multiple data points over a period of time provides a chronological progression, col. 7, lines 57-61); and

determining a characteristic of the phase shift (col. 7, lines 57-61).

It would be obvious to one of skill in the art, at the time of invention, to modify the pump control method taught by Neilsen with the pump control method taught by Westerman in order to prevent the controller from unnecessarily reacting to an instantaneous transient condition, by using data taken at multiple times.

Referring to claim 5, Neilsen and Westerman teach all the limitations of claim 1 as detailed above. Neilsen further teaches a method wherein:

the assignment step, includes the step of assigning the determined characteristic to a predetermined characteristic value range linked to a pump operating state (col. 6, lines 54-62).

Referring to claim 6, Neilsen and Westerman teach all the limitations of claim 5 as detailed above. Neilsen does not teach the step of reading a phase shift progression of over time. Westerman further teaches a method wherein:

the determination step includes the step of determining the extent of the slope of the chronological progression of the phase shift (col. 7, lines 12-16 and lines 20-24); and

the assignment step includes the step of assigning the determined extent of slope to a predetermined slope value range linked to a pump operating state (col. 7, lines 24-28).

It would be obvious to one of skill in the art, at the time of invention, to modify the pump control method taught by Neilsen with the pump control method taught by Westerman in order to prevent the controller from unnecessarily reacting to an instantaneous transient condition, by using a data trend taken over a period of time.

Referring to claim 9, Neilsen and Westerman teach all the limitations of claim 1 as detailed above. Neilsen does not teach the step of using sliding averaging. Westerman further teaches a method wherein:

the determination of the chronological progression of the phase shift in the determination step includes the step of sliding averaging (col. 7, lines 55-66).

It would be obvious to one of skill in the art, at the time of invention, to modify the pump control method taught by Neilsen with the pump control method taught by Westerman in order to prevent the controller from unnecessarily reacting to an instantaneous transient condition, by using a data trend taken over a period of time.

Referring to claim 10, Neilsen teaches all the limitations of claim 1 as detailed above. Neilsen does not teach the step of converting voltage and current signals to a rectangular signal. Westerman further teaches a method wherein:

the measurement step includes a conversion of the measured alternating voltage signal and of the measured alternating current signal into rectangular signals (fig. 2).

It would be obvious to one of skill in the art, at the time of invention, to modify the pump control method taught by Neilsen with the pump control method taught by Westerman in order to prevent the controller from unnecessarily reacting to an instantaneous transient condition, by analyzing a data trend taken over a period of time.

Referring to claims 11 and 13, Neilsen teaches all the limitations of claim 1 as detailed above and further teaches a device comprising:

a microcontroller including:

a timer (col. 7, lines 15-20);

a voltage inlet (22, 136, 138), (col. 3, lines 64-65) for recording a start signal;

a current inlet (208, 264) for recording a stop signal;

Neilsen does not teach a device having memory for storing timer content wherein the microcontroller and timer are used to monitor and evaluate changes in conditions.

Westerman teaches a device and method further comprising:

a memory (32) for saving a timer content;

the memory comprises a number of memory cells to save a sequence of memory contents; and

a voltage and current inlet (col. 5, lines 65-66) being constructed to interpret exceeding of a predetermined voltage signal level (col. 6, lines 54-58) as a start or stop signal, with a content of the timer being proportional to chronological gap between the start signal and stop signal (col.7, lines 49-53);

wherein a microcontroller (24) comprises an evaluation unit for averaging the memory (32) contents (col. 7, lines 57-61).

It would be obvious to one of skill in the art, at the time of invention, to modify the pump control method taught by Neilsen with the pump control method taught by Westerman in order properly start and stop the pump based on operational data analyzed over a period of time.

Referring to claim 14, Neilsen and Westerman teach all the limitations of claim 11 as detailed above. Neilsen further teaches:

an interface for transmitting operating state-related data to a control unit (160) for controlling the liquid circuit (164, 168, 172, 176, 180, 184, 188, 190).

Referring to claim 15, Nielsen and Westerman teach all the limitations of claim 1, as detailed above and Nielsen further teaches a pump control method comprising the steps wherein:

the pump operating state is a low water level state (co. 6, lines 27-31).

Claims 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nielsen and Westerman as applied to claim 4 above and in further view of U. S. Patent 4,896,101 to Cobb.

Referring to claims 7-8, Neilsen and Westerman teach all the limitations of claim 1 as detailed above. Neilsen further teaches a method wherein:

an assignment step includes the step of assigning the determined amplitude of the phase shift to a predetermined amplitude value range linked to a pump operating state (col. 6, lines 28-32 and lines 54-62).

Neilsen and Westerman do not teach the step of reading a phase shift progression of over time. Cobb teaches a method wherein:

a determination step comprises a transformation step in which a chronological progression is subjected to a discrete Fourier transform and the amplitude of the Fourier transform in a predetermined frequency range is determined (col. 7, lines 25-28).

It would be obvious to one of skill in the art, at the time of invention, to modify the pump control method taught by Neilsen and Westerman with the data analysis method taught by Cobb in order to prevent the controller from unnecessarily reacting to an instantaneous transient condition, by using a data trend analyzed by a Fourier transformation over a period of time.

Response to Arguments

Applicant's arguments with respect to claims 1, 5, 6, 9-11 and 13-15 have been fully considered. Applicant argues that Westerman fails to disclose a determination step. As detailed above, Westerman does disclose a determination step and therefore this argument is not persuasive.

Applicant's arguments with respect to claims 7 and 8 have been fully considered. Applicant argues that Cobb does not teach the use of a Fourier transformation applied

specifically to phase shift data. Neilsen and Waterman both teach the analysis of phase shift data for an electric pump system. Cobb teaches the use of a Fourier transformation in the analysis of data, including "power characteristics" for an electric pump system (Cobb col. 8, lines 8-11). As Neilsen and Waterman already teach the analysis of phase shift data, there is no need for Cobb to teach the use of a Fourier transformation specifically in the analysis of phase shift data. Furthermore, it would be obvious that the "power characteristics" of a pump and motor would include phase shift data. Applicant's argument is not persuasive.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bryan Lettman whose telephone number is (571) 270-7860. The examiner can normally be reached on Monday - Thursday between 9:00 am and 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on (571) 272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/B. L./
Examiner, Art Unit 3746

/Devon C Kramer/
Supervisory Patent Examiner, Art Unit 3746